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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

Product Summary

Device	$V_{(BR)DSS}$	$R_{DS(on)}$	I_D $T_A = 25^\circ C$
Q1	30V	28mΩ @ $V_{GS} = 10V$	7.1A
		45mΩ @ $V_{GS} = 4.5V$	5.6A
Q2	-30V	25mΩ @ $V_{GS} = -10V$	-7.4A
		41mΩ @ $V_{GS} = -4.5V$	-5.7A

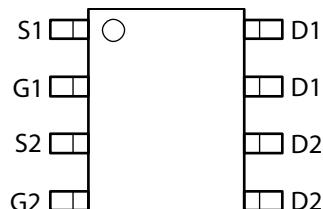
Description and Applications

This new generation complementary dual MOSFET features low on-resistance and fast switching, making it ideal for high efficiency power management applications.

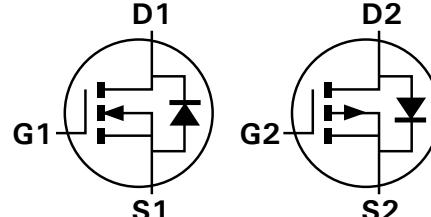
- Motor control
- Backlighting
- DC-DC Converters
- Power management functions



TOP VIEW



Top view



Q1 N-Channel

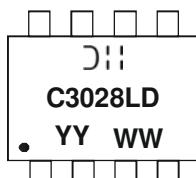
Q2 P-Channel

Ordering Information (Note 1)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMC3028LSD-13	C3028LD	13	12	2,500

Note: 1. Diodes, Inc. defines "Green" products as those which are Eu RoHS compliant and contain no halogens or antimony compounds; further information about Diodes Inc.'s "Green" Policy can be found on our website. For packaging details, go to our website

Marking Information



○ = Manufacturer's Marking
 C3028LD = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Year (ex: 09 = 2009)
 WW = Week (01-52)

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

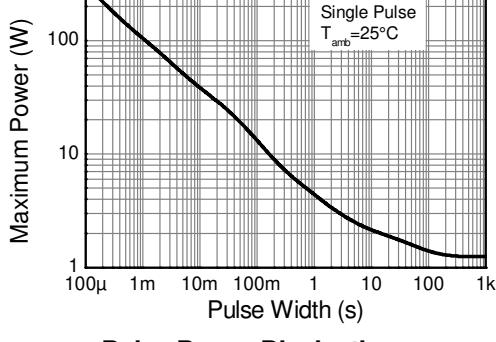
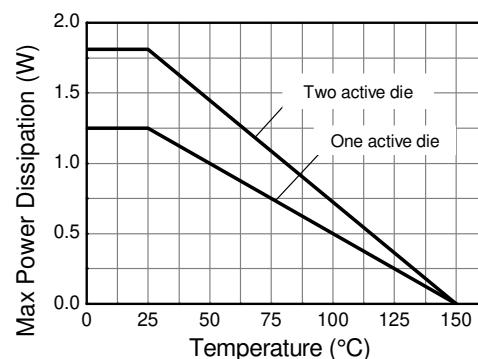
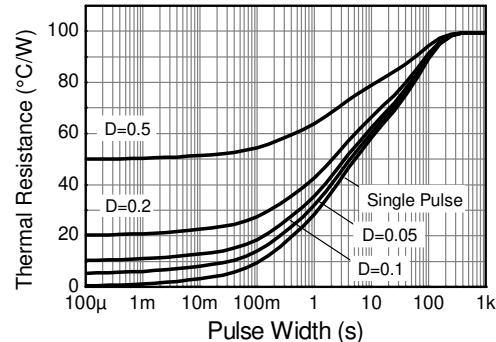
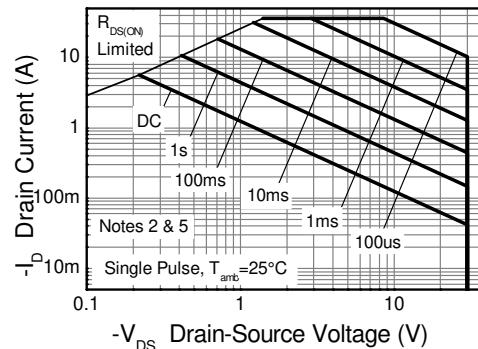
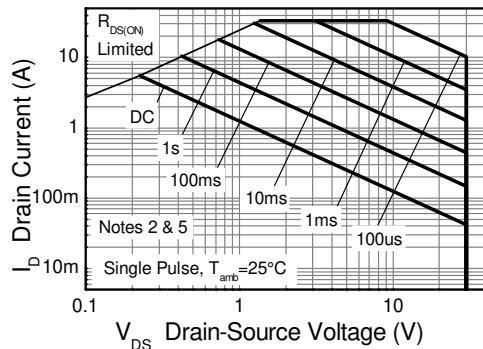
Characteristic		Symbol	N-Channel - Q1	P-Channel - Q2	Units
Drain-Source Voltage		V_{DSS}	30	-30	V
Gate-Source Voltage		V_{GSS}	± 20	± 20	V
Continuous Drain Current	$V_{GS} = 10\text{V}$	(Notes 3 & 5)	I_D	7.1	-7.4
		$T_A = 70^\circ\text{C}$ (Notes 3 & 5)		5.7	-5.9
		(Notes 2 & 5)		5.5	-5.8
		(Notes 2 & 6)		6.6	-6.8
Pulsed Drain Current	$V_{GS} = 10\text{V}$	(Notes 4 & 5)	I_{DM}	34	-36
Continuous Source Current (Body diode)		(Notes 3 & 5)	I_S	3.5	-3.5
Pulsed Source Current (Body diode)		(Notes 4 & 5)	I_{SM}	34	-36

Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic		Symbol	N-Channel - Q1	P-Channel - Q2	Unit
Power Dissipation		P_D	1.3		W
Linear Derating Factor			10		$\text{mW}/^\circ\text{C}$
Power Dissipation		P_D	1.8		W
Linear Derating Factor			14		$\text{mW}/^\circ\text{C}$
Power Dissipation		P_D	2.1		W
Linear Derating Factor			17		$\text{mW}/^\circ\text{C}$
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	100		$^\circ\text{C}/\text{W}$
(Notes 2 & 5)			70		
(Notes 2 & 6)			60		
(Notes 3 & 5)					
Thermal Resistance, Junction to Lead	(Notes 5 & 7)	$R_{\theta JL}$	51	46	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150		$^\circ\text{C}$

Notes:

2. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
3. Same as note (2), except the device is measured at $t \leq 10$ sec.
4. Same as note (2), except the device is pulsed with $D = 0.02$ and pulse width 300 μs . The pulse current is limited by the maximum junction temperature.
5. For a dual device with one active die.
6. For a device with two active die running at equal power.
7. Thermal resistance from junction to solder-point (at the end of the drain lead).

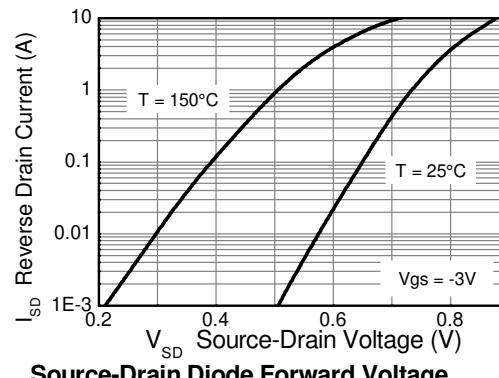
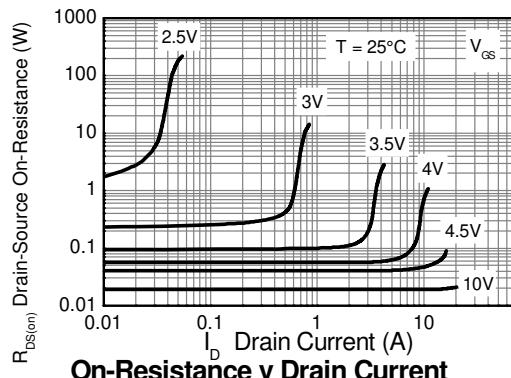
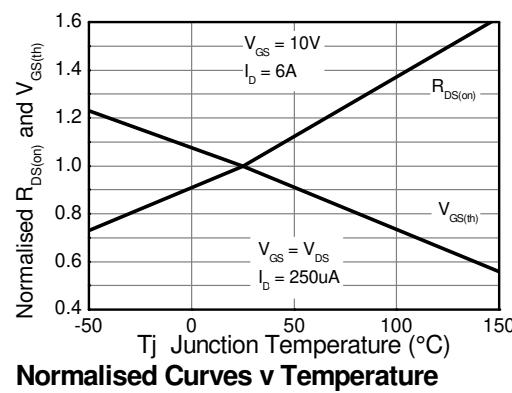
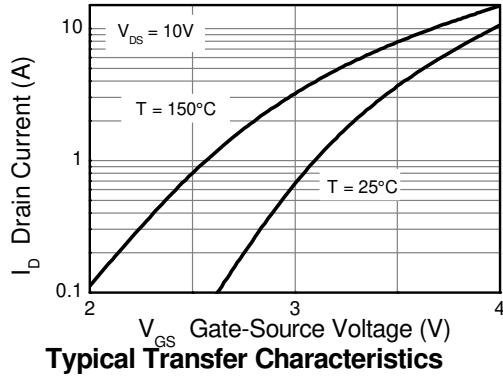
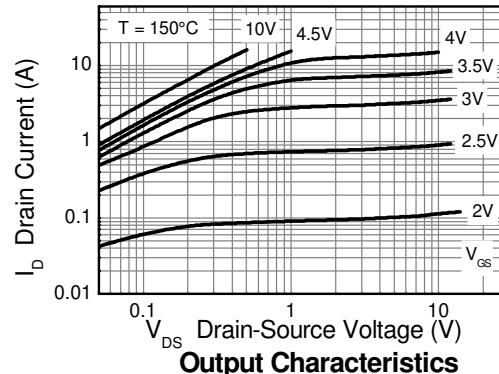
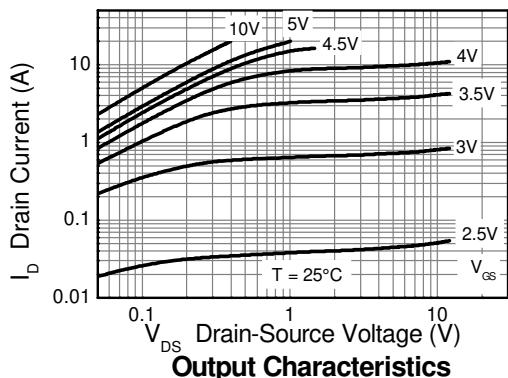


Electrical Characteristics – Q1 N-Channel @T_A = 25°C unless otherwise specified

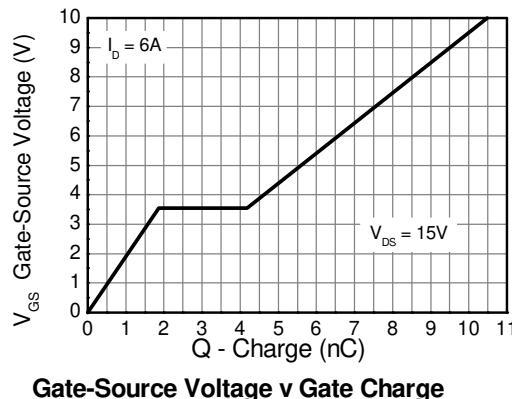
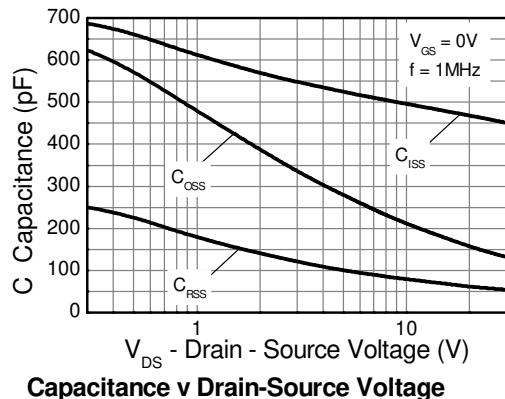
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	I _D = 250μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	0.5	μA	V _{DS} = 30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	1.0	—	3.0	V	I _D = 250μA, V _{DS} = V _{GS}
Static Drain-Source On-Resistance (Note 8)	R _{DS (ON)}	—	—	0.028	Ω	V _{GS} = 10V, I _D = 6.0A
				0.045		V _{GS} = 4.5V, I _D = 4.9A
Forward Transconductance (Notes 8 & 9)	g _{fs}	—	12	—	S	V _{DS} = 15V, I _D = 6.0A
Diode Forward Voltage (Note 8)	V _{SD}	—	0.68	1.2	V	I _S = 1.7A, V _{GS} = 0V
Reverse recovery time (Note 9)	t _{rr}	—	11.5	—	ns	I _S = 1.7A, di/dt = 100A/μs
Reverse recovery charge (Note 9)	Q _{rr}	—	4.4	—	nC	
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	472	—	pF	V _{DS} = 15V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{oss}	—	178	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	65	—	pF	
Total Gate Charge	Q _g	—	5.2	—	nC	V _{DS} = 15V, V _{GS} = 4.5V I _D = 6A
Total Gate Charge	Q _g	—	10.5	—	nC	
Gate-Source Charge	Q _{gs}	—	1.86	—	nC	V _{DS} = 15V, V _{GS} = 10V I _D = 6A
Gate-Drain Charge	Q _{gd}	—	2.3	—	nC	
Turn-On Delay Time (Note 10)	t _{D(on)}	—	2.5	—	ns	V _{DD} = 15V, V _{GS} = 10V I _D = 1A, R _G ≥ 6.0Ω
Turn-On Rise Time (Note 10)	t _r	—	3.1	—	ns	
Turn-Off Delay Time (Note 10)	t _{D(off)}	—	14	—	ns	
Turn-Off Fall Time (Note 10)	t _f	—	9.7	—	ns	

Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
 9. For design aid only, not subject to production testing.
 10. Switching characteristics are independent of operating junction temperatures.

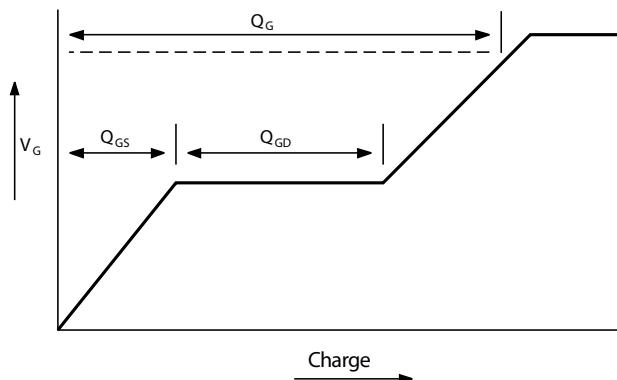
Q1 N-Channel



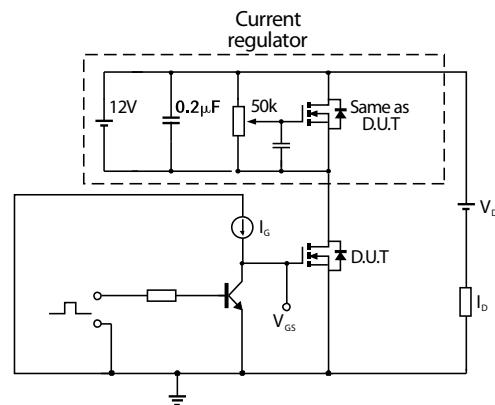
Q1 N-Channel continued



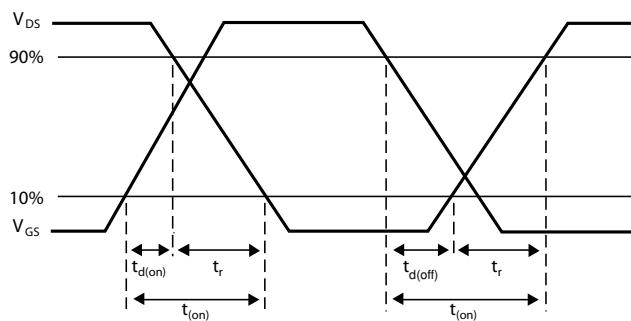
Test Circuits – Q1 N-Channel



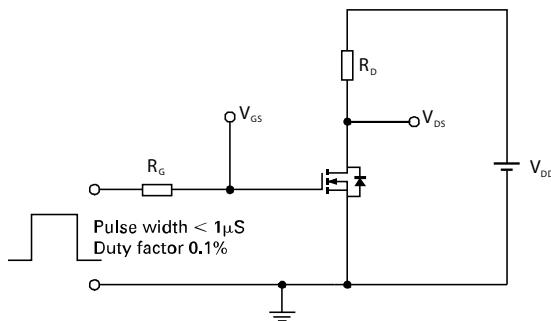
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms



Switching time test circuit

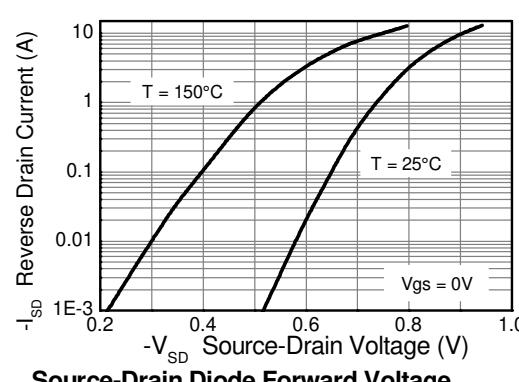
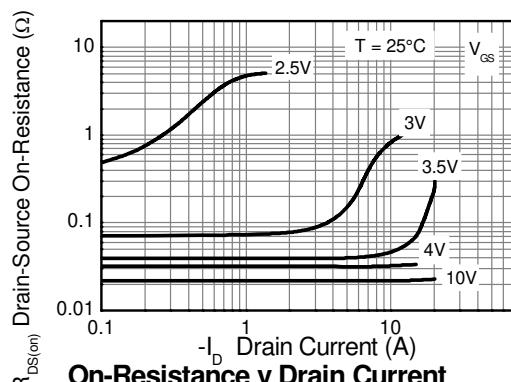
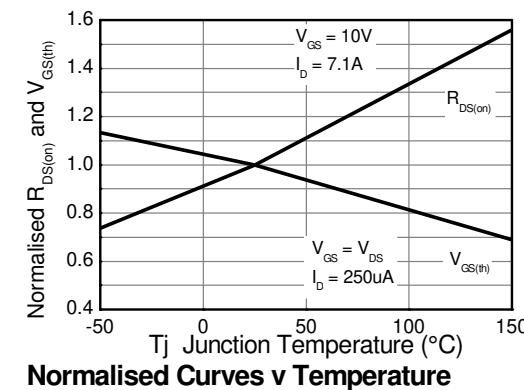
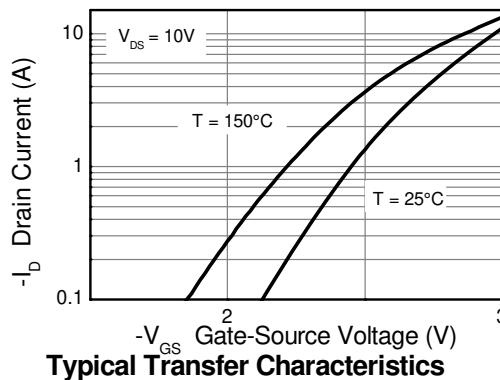
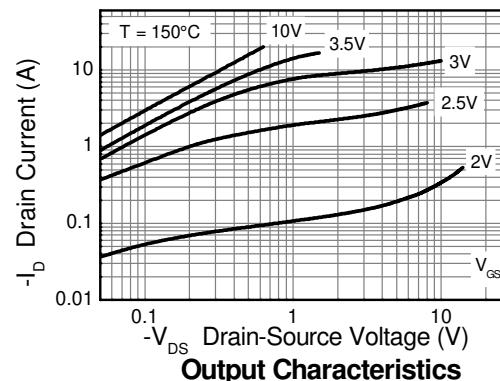
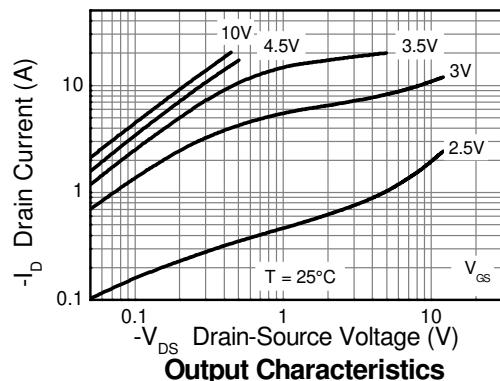
Electrical Characteristics – Q2 P-Channel @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	-30	—	—	V	$I_D = -250\mu\text{A}$, $V_{GS} = 0\text{V}$
Zero Gate Voltage Drain Current	I_{DSS}	—	—	-0.5	μA	$V_{DS} = -30\text{V}$, $V_{GS} = 0\text{V}$
Gate-Source Leakage	I_{GSS}	—	—	± 100	nA	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(\text{th})}$	-1.0	—	-3.0	V	$I_D = -250\mu\text{A}$, $V_{DS} = V_{GS}$
Static Drain-Source On-Resistance (Note 8)	$R_{DS(\text{ON})}$	—	—	0.025	Ω	$V_{GS} = -10\text{V}$, $I_D = -7.1\text{A}$
				0.041		$V_{GS} = -4.5\text{V}$, $I_D = -5.5\text{A}$
Forward Transconductance (Notes 8 & 9)	g_{fs}	—	18.6	—	S	$V_{DS} = -15\text{V}$, $I_D = -7.1\text{A}$
Diode Forward Voltage (Note 8)	V_{SD}	—	-0.80	-1.2	V	$I_S = -1.7\text{A}$, $V_{GS} = 0\text{V}$
Reverse recovery time (Note 9)	t_{rr}	—	16.2	—	ns	$I_S = -2.2\text{A}$, $di/dt = 100\text{A}/\mu\text{s}$
Reverse recovery charge (Note 9)	Q_{rr}	—	10	—	nC	
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	1678	—	pF	$V_{DS} = -15\text{V}$, $V_{GS} = 0\text{V}$ $f = 1\text{MHz}$
Output Capacitance	C_{oss}	—	303	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	178	—	pF	
Total Gate Charge	Q_g	—	16.4	—	nC	$V_{DS} = -15\text{V}$, $V_{GS} = -4.5\text{V}$ $I_D = -7.1\text{A}$
Total Gate Charge	Q_g	—	31.6	—	nC	$V_{DS} = -15\text{V}$, $V_{GS} = -10\text{V}$ $I_D = -7.1\text{A}$
Gate-Source Charge	Q_{gs}	—	4.3	—	nC	
Gate-Drain Charge	Q_{gd}	—	6.2	—	nC	
Turn-On Delay Time (Note 10)	$t_{D(\text{on})}$	—	3.5	—	ns	$V_{DD} = -15\text{V}$, $V_{GS} = -10\text{V}$ $I_D = -1\text{A}$, $R_G \geq 6.0\Omega$
Turn-On Rise Time (Note 10)	t_r	—	4.9	—	ns	
Turn-Off Delay Time (Note 10)	$t_{D(\text{off})}$	—	44	—	ns	
Turn-Off Fall Time (Note 10)	t_f	—	28	—	ns	

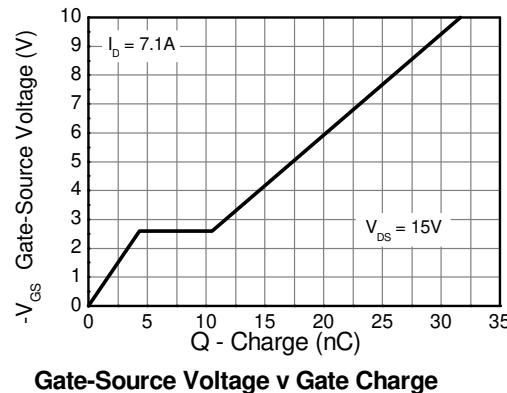
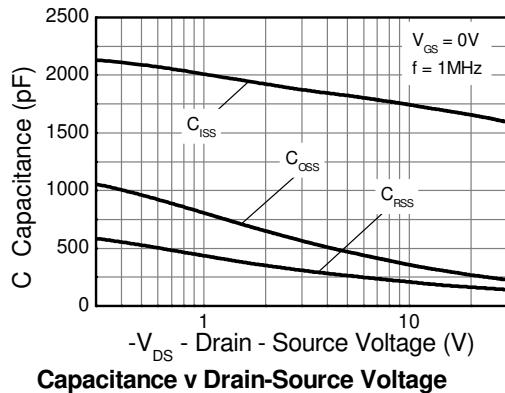
Notes:

- 8. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$
- 9. For design aid only, not subject to production testing.
- 10. Switching characteristics are independent of operating junction temperatures.

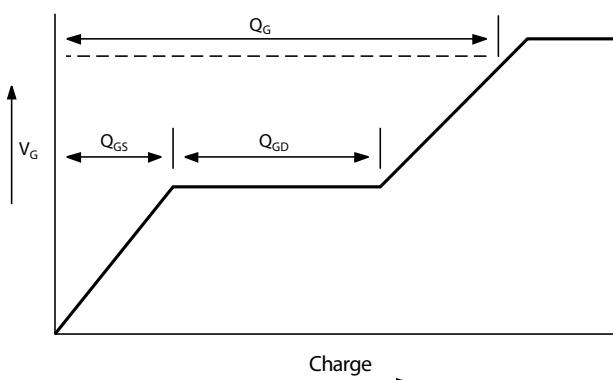
Q2 P-Channel



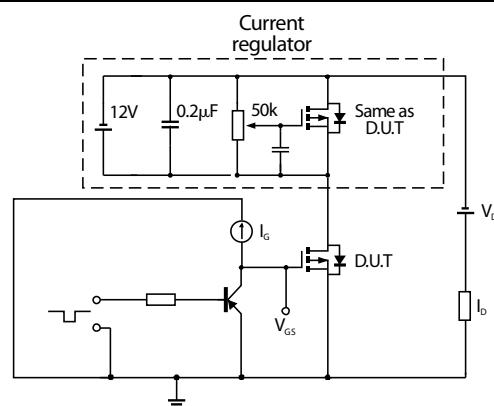
Q2 P-Channel continued



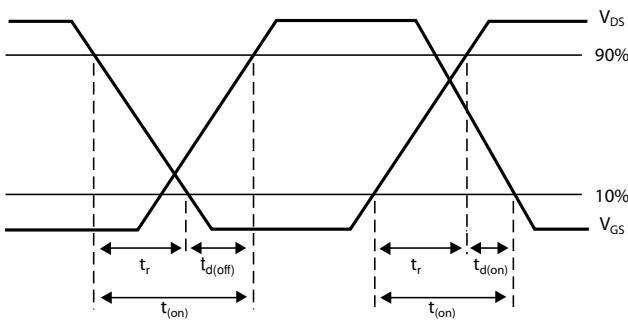
Test Circuits – Q2 P-Channel



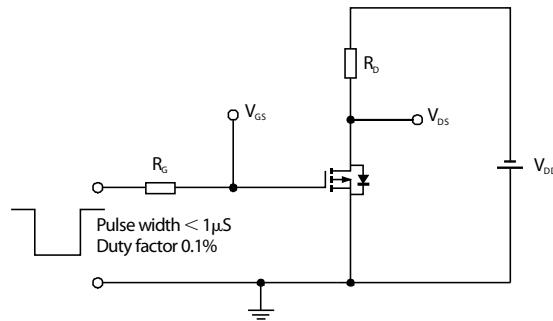
Basic gate charge waveform



Gate charge test circuit

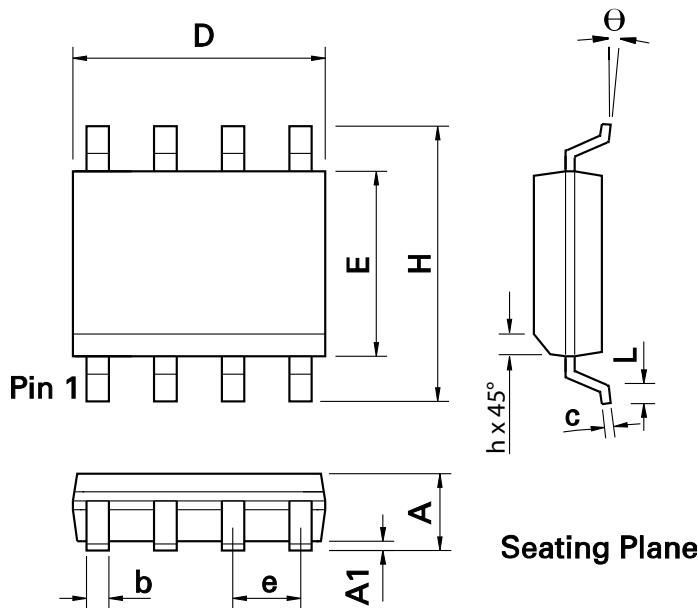


Switching time waveforms



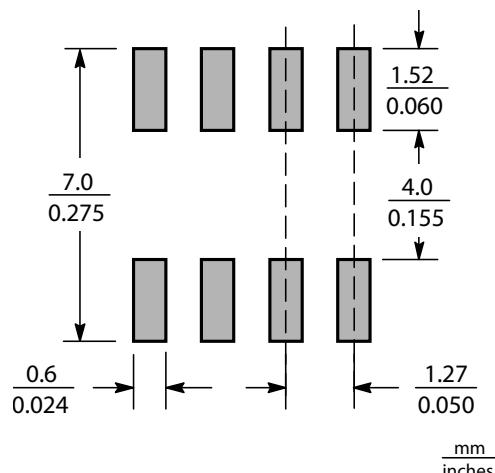
Switching time test circuit

Package Outline Dimensions



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.053	0.069	1.35	1.75	e	0.050 BSC		1.27 BSC	
A1	0.004	0.010	0.10	0.25	b	0.013	0.020	0.33	0.51
D	0.189	0.197	4.80	5.00	c	0.008	0.010	0.19	0.25
H	0.228	0.244	5.80	6.20	θ	0°	8°	0°	8°
E	0.150	0.157	3.80	4.00	h	0.010	0.020	0.25	0.50
L	0.016	0.050	0.40	1.27	-	-	-	-	-

Suggested Pad Layout



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